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PHASE CONFLICT RESOLUTION FOR PHOTOLITHOGRAPHIC MASKS

ABSTRACT

[0098] A photolithographic mask used for defining a layer in an integrated circuit, or other work piece, where the layer comprises a pattern including a plurality of features to be implemented with phase shifting in phase shift regions is laid out including for patterns comprising high density, small dimension features, and for "full shift" patterns. The method includes identifying cutting areas for phase shift regions based on characteristics of the pattern. Next, the process cuts the phase shift regions in selected ones of the cutting areas to define phase shift windows, and assigns phase values to the phase shift windows. The phase shift values assigned comprise ϕ and θ, so that destructive interference is caused in transitions between adjacent phase shift windows having respective phase shift values of ϕ and θ. In the preferred embodiment, ϕ is equal to approximately $\theta + 180$ degrees. Results of the cutting and assigning steps are stored in a computer readable medium, used for manufacturing a mask, and used for manufacturing an integrated circuit. By identifying the cutting areas based on characteristics of the pattern to be formed, the problem of dividing phase shift regions into phase shift windows, and assigning phase shift values to the windows is simplified.